patiens Balsamina and *Tropæolum majus*. There can be no doubt, therefore, as to the cause of the disease, and land on which any of the common Solanaceous plants have wilted should not be planted to *Ricinus*, unless it is known positively that the wilt was not of bacterial origin. Dwarfing is usually the first sign of the disease in seedling *Ricinus* plants.

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CELLULOID LANTERN-SLIDES

LANTERN-SLIDES made by the simple process of merely drawing or writing with ink on thin sheets of celluloid are often useful in presenting to an audience simple diagrams and sketches, tabulated data, mathematical expressions, et cetera.

Some years ago Mr. E. D. Tillyer, one of my colleagues at the Bureau of Standards, told me of slides that had been made by tracing on sheets of gelatine, which were afterwards bound between plates of glass to keep them flat. I found these of great use in illustrating a lecture with diagrams that I copied from published articles—far more convenient than blackboard sketches or large paper charts. But the method is subject to three somewhat annoying defects:

(1) Continual clogging of the pen and spreading of the ink while tracing a drawing, (2) impossibility of making inconspicuous erasures, (3) necessity of binding each tracing between two sheets of glass. The first two defects were removed by substituting for the gelatine a less soluble material, the third by constructing a set of glass pockets into which the slides could be slipped.

A slide of simple character can be made by writing or sketching directly upon the sheet of celluloid, using an ordinary steel pen of proper fineness, with india or colored ink. More complicated drawings and diagrams from publications are most easily made by tracing. Mistakes may be erased by wiping with damp cloth or paper. For firm, smooth lines of uniform thickness the ordinary draftsman's tools are needed: straight edge, French curves, ruling pen, and compass pen. Very fine lines are produced by scratching the surface with a needle point. Although scarcely visible on the slide, these will show up black and sharp when projected on the screen. Typewriting directly on the celluloid also projects well.

Other transparent materials can, of course, be used instead of celluloid. Gelatine yields fairly good slides but is difficult to work because of its solubility. Even tracing cloth and waxed paper are usable; although their limited transparency produces a rather dark field, and the texture of the material shows plainly.

To fit the standard $3\frac{1}{4}$ inch $\times$ 4 inch lantern-slide cover-glasses the celluloid should be trimmed to $3 \times 3\frac{1}{2}$ inches. During the process of tracing, it is more convenient to have the celluloid somewhat larger than $3 \times 3\frac{1}{2}$ inches to allow sufficient margin for holding it against the original by means of thumb-tacks or a paperweight. The margins may be trimmed later, leaving the drawing centrally located on the slide.

A glass pocket to hold celluloid slides in the projecting lantern is easily made from two $3\frac{1}{4}$ $\times$ 4 inch lantern-slide cover-glasses. These are held apart by strips of card, 7/32 inch wide and somewhat thicker than the celluloid, pasted along the entire length of each short edge and along an inch or so at each end of one of the longer edges. The glass plates are bound together by strips of black paper pasted over the edges as in making an ordinary lantern-slide, except that the binding is omitted where the separating strips of card are absent. The longer edge that is entirely free from binding forms the top of the pocket; the central opening left in the opposite edge is for inserting a piece of card to eject the celluloid slide when it can not be shaken out. Both of the longer edges of each glass are ground smooth and are somewhat beveled on the sides that form the interior of the pocket, so as to facilitate insertion and removal of the celluloid. A small white lable in an upper right-hand corner serves as a thumb mark for guiding the lantern operator.

The edges of the glass are ground by rubbing upon a sheet of carborundum paper moistened with turpentine, or upon a metal or glass plate fed with carborundum and turpentine or water.

It will be found convenient to have a dozen or two pockets—as many as are likely to be used in a single lecture, and to letter them consecutively on the thumb labels. A large collection of slides will take up very little room and will weigh very little. To avoid scratching, it is well to keep adjacent slides separated by sheets of paper of the same size. Before a lecture one merely arranges the empty pockets in the order of their letters and inserts the slides in the order in which they are to be shown.

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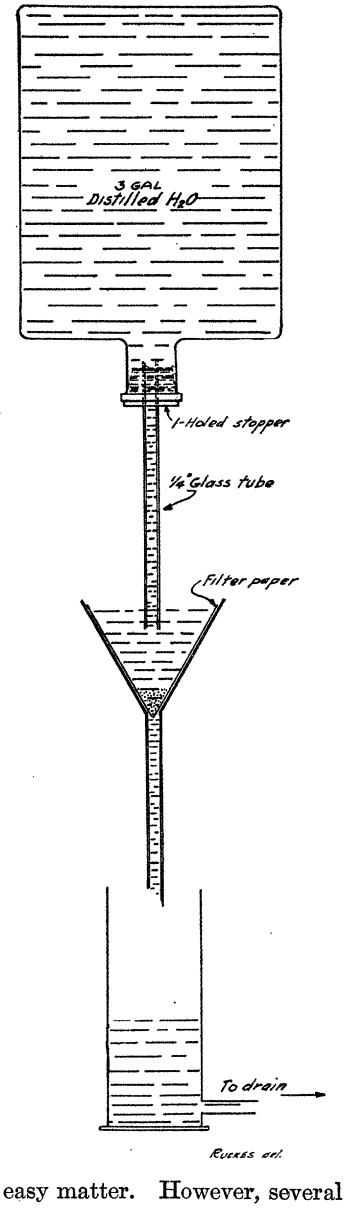
WASHING MICROSCOPIC ORGANISMS

One of the big hindrances to the study of plankton organisms is the difficulty encountered in manipulating these microscopic plants and animals during the first few steps of the technique. Hall (*Bot. Gaz.*, May, 1917) has outlined a method that the present writer has used for some years while at Cornell University. The problem of thoroughly and easily washing plankton material was one of the big features with which to contend.

For both diatoms and fresh-water crustacea the following procedure was found to be efficient:

1. Kill and fix the material in a mixture of
   Chromic acid .... one part,
   Acetic acid ..... one half part,
   Distilled water ... four hundred parts.
2. Wash by filtering through funnel.
3. Mordant in one quarter per cent. ferric alum for thirty minutes.
4. Wash again in funnel.
5. Stain in one half per cent. hemotoxylin for two hours.
6. Destain and wash as above.
7. Dehydrate by the glycerine method and mount, or
8. Dehydrate by the glycerine method and wash with 95 per cent. alcohol.
9. Ten per cent. Venetian turpentine, concentrate and mount.

The process of washing, originally, was to allow water to drip on the material that was held in a filter paper in a funnel. This may



seem an easy matter. However, several things have to be taken into account. Chief among these is to maintain a constant flow of water during the process. Frequently a prolonged